LISTING OF CLAIMS

1-13. (Cancelled)

14. (Currently amended) A method of heating water stored in a water tank of a storage-type water heater comprising

a first electric-resistance heating element comprising a thermal surface disposed within an inner surface of the tank at a first location,

a second electric-resistance heating element comprising a thermal surface disposed within the inner surface of the tank at a second location disposed vertically above the first location, and

first and second temperature sensors associated with the first and second heating elements, respectively,

a third temperature sensor coupled to the tank at a third location disposed vertically between the first and second locations, the method comprising:

sensing a first temperature with the first temperature sensor;

sensing a second temperature with the second temperature sensor;

preventing power to the second heating element and controllably providing power to the first heating element if the first temperature is below a first set point, the second temperature is above a second set point, and zero or more other conditions exist;

preventing power to the first heating element and controllably providing power to the second heating element if the second temperature is below a second set point and zero or more other conditions exist; ~~and~~

preventing power to the first and second heating elements if the first and second temperatures are above the first and second set points, respectively, and zero or more other conditions ~~exist~~ exist; and

wherein the acts of preventing power to the second heating element and controllably providing power to the first heating element and preventing power to the first heating element and controllably providing power to the second heating element occur during normal operation, and wherein the method further comprises

sensing a third temperature with the third temperature sensor;

ceasing normal operation if the third temperature is below a third set point and zero or more other conditions exist; and

entering boost operation if the third temperature is below a third set point and zero or more other conditions exist.

15. (Original) A method as set forth in claim 14 wherein the first and second set points are the same.

16. (Cancelled)

17. (Currently amended) A method as set forth in ~~claim 16~~ claim 14 wherein the act of entering boost operation comprises controllably providing power to the second heating element when the third temperature is below a third set point.

18. (Original) A method as set forth in claim 17 wherein the act of entering boost operation further comprises preventing power to the first heating element.

19. (Currently amended) A method as set forth in ~~claim 16~~ claim 14 wherein the water heater further comprises a fourth temperature sensor coupled to the tank at a fourth location associated with a hot water outlet of the tank, and wherein the method comprises:

sensing a fourth temperature with the fourth temperature sensor;

ceasing normal operation if the fourth temperature sensor is above a fourth set point and zero or more other conditions exist; and

preventing power to the first and second heating elements after the fourth temperature sensor is above a fourth set point and zero or more other conditions exist.

20. (Currently amended) A method as set forth in ~~claim 16~~ claim 14 and further comprising:

manually ceasing normal operation; and

manually entering boost operation.

21. (Currently amended) A method as set forth in ~~claim 16~~ claim 14 wherein the act of manually entering boost operation comprises controllably providing power to the second heating element and preventing power to the first heating element.

22. (Currently amended) A method as set forth in ~~claim 16~~ claim 14 wherein the third set point is greater than the second set point.

23-29. (Cancelled)

30. (Currently amended) A method of controlling a storage-type water heater comprising

a water tank comprising an inner surface

a first electric-resistance heating element comprising a thermal surface disposed within the inner surface at a first location,

a second electric-resistance heating element comprising a thermal surface disposed within the inner surface at a second location, and

a control system to operate the first and second heating elements, wherein the control system comprises a current sensor associated with the first heating element, the method comprising:

controllably providing power to the first and second heating elements to heat water stored in the water tank;

detecting the failure of one of the first and second heating elements;

if detecting the failure of one of the first and second heating elements and zero or more other conditions exist,

preventing power to the failed heating element; and

controllably providing power to the non-failed heating element to heat water stored in the water ~~tank~~ tank;

wherein the act of controllably providing power to the first and second heating elements comprises controllably providing power to the first heating element;

wherein the method further comprises sensing first and second currents with the current sensor, the second current sensed after the first current; and

wherein the act of detecting the failure comprises calculating first and second resistance values with the first and second currents, respectively, calculating a resistance rate change with the first and second resistance values, comparing the resistance rate change to a threshold resistance rate change, the threshold resistance rate change indicating scale buildup, and determining a failure for the first heating element if scale buildup occurs and zero or more other conditions exist.

31. (Original) A method as set forth in claim 30 and further comprising:

if detecting the failure of one of the first and second heating elements and zero or more other conditions exist,

issuing an alarm.

32. (Currently amended) A method as set forth in claim 30 wherein the control system comprises ~~at least one temperature~~ a temperature sensor ~~and at least one current sensor~~ associated with the first ~~and second~~ heating ~~elements~~ element, wherein the method further comprises sensing at least one temperature with the ~~at least one~~ temperature sensor, wherein the act of controllably providing power to the first ~~and second~~ heating ~~elements~~ element is based on the sensed at least one temperature, and wherein the act of detecting the failure comprises sensing a decrease in current to ~~at least one of~~ the first ~~and second~~ heating ~~elements~~ element.

33. (Currently amended) A method as set forth in claim 30 wherein the control system comprises first and second temperature sensors associated with the first and second heating elements, respectively, and ~~first and second~~ a second current ~~sensors~~ sensor associated with the ~~first and~~ second heating ~~elements, respectively,~~ element, wherein the method further comprises sensing a first temperature with the first temperature sensor and sensing a second temperature with the second temperature sensor, wherein the act of controllably providing power to the first and second heating elements is based on the first and second temperatures, and wherein the act of detecting the failure

comprises sensing a decrease in one of a ~~first~~ third and ~~second~~ fourth current sensed by the first and second current sensors, respectively.

34. (Currently amended) A method as set forth in claim 33 wherein the act of controllably providing power to the first and second heating elements comprises controllably providing power to the first heating element, and wherein the act of sensing a ~~first~~ third current occurs during the act of providing power to the first heating element.

35. (Currently amended) A method as set forth in claim 34 wherein the act of detecting the failure further comprises determining a failure if the ~~first~~ third current is less than a threshold current and zero or more other conditions exist, the threshold current indicating insufficient current is flowing to the first heating element.

36. (Currently amended) A method as set forth in claim 34 wherein the act of detecting the failure comprises determining a first resistance of the first heating element based on the ~~first~~ third current, determining a failure for the first heating element if the first resistance is greater than a threshold and zero or more other conditions exist.

37. (Original) A method as set forth in claim 36 wherein the threshold indicates a first heating circuit comprising the first heating element has an open circuit condition.

38. (Original) A method as set forth in claim 36 wherein the threshold indicates a dry-fire condition for the first heating element.

39. (Original) A method as set forth in claim 38 wherein the act of controllably providing power to the non-failed element comprises preventing power to both the failed heating element and the non-failed heating element if the detected failure is a dry-fire condition and zero or more other conditions exist.

40. (Currently amended) A method as set forth in claim 33 wherein the act of controllably providing power to the first and second heating elements comprises

controllably providing power to the first heating element, wherein the act of sensing a first temperature occurs during the act of providing power to the first heating element, and wherein the act of sensing a ~~first~~ third current occurs during the act of providing power to the first heating element.

41-43. (Cancelled).

44. (Previously presented) A method as set forth in claim 14 and further comprising:

detecting the failure of one of the first and second heating elements;

if detecting the failure of one of the first and second heating elements and zero or more other conditions exist,

preventing power to the failed heating element; and

modifying the control of the non-failed heating element.

45. (Previously presented) A method as set forth in claim 44 wherein the modifying act comprises controllably providing power to the non-failed heating element to heat water stored in the water tank.

46. (Previously presented) A method as set forth in claim 44 and further comprising:

if detecting the failure of one of the first and second heating elements and zero or more other conditions exist,

issuing an alarm.

47. (Previously presented) A method as set forth in claim 44 wherein the water heater further comprises at least one current sensor associated with the first and second heating elements, and wherein the act of detecting the failure comprises sensing a decrease in current to at least one of the first and second heating elements.

48. (Previously presented) A method as set forth in claim 44 wherein the water heater further comprises first and second current sensors associated with the first and second heating elements, respectively, and wherein the act of detecting the failure comprises

sensing a decrease in one of a first and second current sensed by the first and second current sensors, respectively.

49. (Previously presented) A method as set forth in claim 48 wherein the act of detecting the failure further comprises determining a failure if the first current is less than a threshold current and zero or more other conditions exist, the threshold current indicating insufficient current is flowing to the first heating element.

50. (Previously presented) A method as set forth in claim 48 wherein the act of detecting the failure comprises determining a first resistance of the first heating element based on the first current, determining a failure for the first heating element if the first resistance is greater than a threshold and zero or more other conditions exist.

51. (Previously presented) A method as set forth in claim 50 wherein the threshold indicates a first heating circuit comprising the first heating element has an open circuit condition.

52. (Previously presented) A method as set forth in claim 50 wherein the threshold indicates a dry-fire condition for the first heating element.

53. (Previously presented) A method as set forth in claim 52 wherein the act of controllably providing power to the non-failed element comprises preventing power to both the failed heating element and the non-failed heating element if the detected failure is a dry-fire condition and zero or more other conditions exist.

54. (Previously presented) A method as set forth in claim 30 wherein the second location is disposed vertically above the first location, wherein the control system comprises first and second temperature sensors associated with the first and second heating elements, respectively, and wherein controllably providing power to the first and second heating elements comprises

sensing a first temperature with the first temperature sensor;

sensing a second temperature with the second temperature sensor;

preventing power to the second heating element and controllably providing power to the first heating element if the first temperature is below a first set point, the second temperature is above a second set point, and zero or more other conditions exist;

preventing power to the first heating element and controllably providing power to the second heating element if the second temperature is below a second set point and zero or more other conditions exist; and

preventing power to the first and second heating elements if the first and second temperatures are above the first and second set points, respectively, and zero or more other conditions exist.

55. (Previously presented) A method as set forth in claim 54 wherein the first and second set points are the same.

56. (Previously presented) A method as set forth in claim 54 wherein the water heater further comprises a third temperature sensor coupled to the tank at a third location disposed vertically between the first and second locations, wherein the acts of preventing power to the second heating element and controllably providing power to the first heating element and preventing power to the first heating element and controllably providing power to the second heating element occur during normal operation, and wherein the method further comprises:

sensing a third temperature with the third temperature sensor;

ceasing normal operation if the third temperature is below a third set point and zero or more other conditions exist; and

entering boost operation if the third temperature is below a third set point and zero or more other conditions exist.

57. (Previously presented) A method as set forth in claim 56 wherein the act of entering boost operation comprises controllably providing power to the second heating element when the third temperature is below a third set point.

58. (Previously presented) A method as set forth in claim 57 wherein the act of entering boost operation further comprises preventing power to the first heating element.

59. (Previously presented) A method as set forth in claim 56 wherein the water heater further comprises a fourth temperature sensor coupled to the tank at a fourth location associated with a hot water outlet of the tank, and wherein the method comprises:

sensing a fourth temperature with the fourth temperature sensor;

ceasing normal operation if the fourth temperature sensor is above a fourth set point and zero or more other conditions exist; and

preventing power to the first and second heating elements after the fourth temperature sensor is above a fourth set point and zero or more other conditions exist.

60. (Previously presented) A method as set forth in claim 56 and further comprising:

manually ceasing normal operation; and

manually entering boost operation.

61. (Previously presented) A method as set forth in claim 60 wherein the act of manually entering boost operation comprises controllably providing power to the second heating element and preventing power to the first heating element.

62. (Previously presented) A method as set forth in claim 66 wherein the third set point is greater than the second set point.

63. (New) A method of controlling a storage-type water heater comprising

a water tank comprising an inner surface

a first electric-resistance heating element comprising a thermal surface disposed within the inner surface at a first location,

a second electric-resistance heating element comprising a thermal surface disposed within the inner surface at a second location, and

a control system to operate the first and second heating elements, wherein the control system comprises a first temperature sensor associated with the first heating element, the method comprising:

controllably providing power to the first and second heating elements to heat water stored in the water tank;

detecting the failure of one of the first and second heating elements;

if detecting the failure of one of the first and second heating elements and zero or more other conditions exist,

preventing power to the failed heating element; and

controllably providing power to the non-failed heating element to heat water stored in the water tank;

wherein the act of controllably providing power to the first and second heating elements comprises controllably providing power to the first heating element;

wherein the method further comprises sensing first and second temperatures with the first temperature sensor, the second temperature sensed after the first temperature, and

wherein the act of detecting the failure comprises calculating a temperature rise with the first and second temperatures, comparing the temperature rise to a threshold temperature rise, the threshold temperature rise indicating scale buildup, and determining a failure for the first heating element if scale buildup occurs and zero or more other conditions exist.

64. (New) A method as set forth in claim 63 and further comprising:

if detecting the failure of one of the first and second heating elements and zero or more other conditions exist,

issuing an alarm.

66. (New) A method as set forth in claim 63 wherein the control system comprises a second temperature sensor associated with the second heating element and first and second current sensors associated with the first and second heating elements, respectively, wherein the method further comprises sensing a third temperature with the

first temperature sensor and sensing a fourth temperature with the second temperature sensor, wherein the act of controllably providing power to the first and second heating elements is based on the third and fourth temperatures, and wherein the act of detecting the failure comprises sensing a decrease in one of a first and second current sensed by the first and second current sensors, respectively.

67. (New) A method as set forth in claim 66 wherein the act of controllably providing power to the first and second heating elements comprises controllably providing power to the first heating element, and wherein the act of sensing a first current occurs during the act of providing power to the first heating element.

68. (New) A method as set forth in claim 67 wherein the act of detecting the failure further comprises determining a failure if the first current is less than a threshold current and zero or more other conditions exist, the threshold current indicating insufficient current is flowing to the first heating element.

69. (New) A method as set forth in claim 67 wherein the act of detecting the failure comprises determining a first resistance of the first heating element based on the first current, determining a failure for the first heating element if the first resistance is greater than a threshold and zero or more other conditions exist.

70. (New) A method as set forth in claim 69 wherein the threshold indicates a first heating circuit comprising the first heating element has an open circuit condition.

71. (New) A method as set forth in claim 69 wherein the threshold indicates a dry-fire condition for the first heating element.

72. (New) A method as set forth in claim 71 wherein the act of controllably providing power to the non-failed element comprises preventing power to both the failed heating element and the non-failed heating element if the detected failure is a dry-fire condition and zero or more other conditions exist.

73. (New) A method as set forth in claim 66 wherein the act of controllably providing power to the first and second heating elements comprises controllably providing power to the first heating element, wherein the act of sensing a third temperature occurs during the act of providing power to the first heating element, and wherein the act of sensing a first current occurs during the act of providing power to the first heating element.